

WHAT IS CLAIMED IS:

1. A joint structure of a robot, comprising:
a first member and a second member connected to each other
for relative rotation through a speed reducer; and
5 a motor for driving the second member for rotation relative to
the first member, wherein

the speed reducer includes a first-stage speed reducing
mechanism and a second-stage speed reducing mechanism,

the first-stage speed reducing mechanism includes an input
10 gear connected directly to the shaft of the motor and a single spur
gear in mesh with the input gear,

the second-stage speed reducing mechanism includes a
crankshaft connected directly to the spur gear, an external gear which
engages the crankshaft to be rocked eccentrically, a casing of the speed
15 reducer, an internal gear which is formed inside the casing and is in
mesh with the external gear, and a rotating member which supports
the crankshaft for rotation and can rotate around the central axis of
the internal gear with respect to the casing,

the casing of the second-stage speed reducing mechanism is
20 attached to the first member,

the second member is attached to the rotating member of the
second-stage speed reducing mechanism, and

the motor is attached to the second member so that the input
gear of the motor is in mesh with the spur gear of the first-stage speed
25 reducing mechanism.

2. The joint structure of a robot according to claim 1, wherein
said second member is provided with a mounting portion for mounting
the motor in a given position and is attached to the rotating member

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by a fitting in order to align the axis of the second member with the axis of the output of the speed reducer, and said second member and said rotating member are configured such that the rotational phase of the second member with respect to the rotating member is settled using a positioning pin when attaching the second member to the rotating member.

3. The joint structure of a robot according to claim 1 or claim 2, wherein said first and second members of the robot have a hollow structure inside, and said casing and said rotating member are provided with through holes around their common axis so that wiring and/or piping is secured inside the joint.

4. A joint structure of a robot, comprising:
a speed reducer including a cylindrical casing, a rotating member rotatably supported on the casing through a first bearing and having a hollow in the center thereof, and a gear speed reducing mechanism arranged on the casing for rotation through a second bearing and having a hollow in the center thereof;

a first member fixed to the casing of the speed reducer and having a hollow in the center thereof;

a second member fixed to the rotating member of the speed reducer and having a hollow in the center thereof; and

a motor fixed to the second member so that the output shaft thereof extends in the direction parallel to the central axis of the speed reducer toward the gear speed reducing mechanism of the speed reducer,

wherein a robot joint is constituted between the first member and the second member in a manner such that the gear speed reducing mechanism of the speed reducer is actuated by the rotation

of the output shaft of the motor to make the second member rock with respect to the first member.

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